

Contents

00 - Technical data	1
1 Technical data	1
1.1 Technical data	1
1.2 Engine number	1
1.3 Engine data	1
10 - Removing and installing engine	3
1 Removing and installing engine	3
1.1 Removing and installing engine	3
1.2 Removing	4
1.3 Attaching engine to engine stand	20
1.4 Installing	21
1.5 Tightening torques	23
13 - Crankshaft group	25
1 Dismantling and assembling engine	25
1.1 Dismantling and assembling engine	25
1.2 Lock carrier: move into service position	25
1.3 Ribbed belt drive for vane pump, alternator and viscous fan; V-belt drive for coolant pump	31
1.4 Ribbed belt drive for air conditioner	40
1.5 Routing of V-belt and ribbed belts	43
1.6 Removing and installing ribbed belt	44
1.7 Removing and installing V-belt	46
1.8 Removing and installing viscous fan	48
1.9 Removing and installing bearing for viscous fan	51
1.10 Removing and installing retainer for alternator, vane pump (power steering) and viscous fan	54
1.11 Toothed belt drive > approx. 05.99	58
1.12 Removing and installing toothed belt > approx. 05.99	63
1.13 Toothed belt drive approx. 06.99 >	68
1.14 Removing and installing toothed belt approx. 06.99 >	73
2 Removing and installing sealing flanges and flywheel/drive plate	78
2.1 Removing and installing sealing flanges and flywheel/drive plate	78
2.2 Renewing crankshaft oil seal on pulley end	82
2.3 Removing and installing dual mass flywheel/drive plate	85
3 Removing and installing crankshaft	88
3.1 Removing and installing crankshaft	88
3.2 Removing and installing needle bearing in crankshaft	91
3.3 Crankshaft dimensions	93
4 Dismantling and assembling pistons and conrods	94
4.1 Dismantling and assembling pistons and conrods	94
4.2 Piston and cylinder dimensions	101
15 - Cylinder head, Valve gear	102
1 Removing and installing cylinder head	102
1.1 Removing and installing cylinder head	102
1.2 Part I	103
1.3 Part II	106
1.4 Removing and installing intake pipe - Engine codes AEB, AJL	109
1.5 Removing and installing intake pipe - Engine codes ANB, APU	112
1.6 Removing and installing cylinder head cover	116
1.7 Remove cylinder head - Engine codes AEB, AJL	119
1.8 Remove cylinder head - Engine codes ANB, APU	122



1.9	Installing cylinder head	126
1.10	Check compression	129
2	Servicing valve gear	131
2.1	Servicing valve gear	131
2.2	Checking camshaft axial clearance	139
2.3	Renewing camshaft oil seals	141
2.4	Removing and installing camshafts and hydraulic chain tensioner	148
2.5	Checking hydraulic bucket tappets	155
2.6	Renewing valve stem seals	157
2.7	Checking valve guides	161
2.8	Reworking valve seats	162
17	- Lubrication	164
1	Removing and installing parts of the lubrication system	164
1.1	Removing and installing parts of the lubrication system	164
1.2	Part I	165
1.3	Part II	170
1.4	Removing and installing oil pan	174
1.5	Removing and installing oil pump	188
1.6	Checking oil pressure and oil pressure switch	189
1.7	Engine oil	191
1.8	Check oil level	191
19	- Cooling system	192
1	Removing and installing parts of the cooling system	192
1.1	Removing and installing parts of the cooling system	192
1.2	Parts of cooling system	193
1.3	Draining and filling cooling system	196
1.4	Removing and installing coolant pump and coolant thermostat	200
1.5	Removing and installing coolant pump	202
1.6	Removing and installing, checking coolant thermostat	205
1.7	Removing and installing bottom coolant pipe	206
1.8	Removing and installing radiator	208
1.9	Checking cooling system for leaks	213
21	- Charging	215
1	Check charge air system with turbocharger	215
1.1	Check charge air system with turbocharger	215
1.2	Safety precautions	215
1.3	Connection diagram for charge air control and vacuum control - Engine codes AEB, AJL	216
1.4	Connection diagram for charge air control and vacuum control - Engine codes ANB, APU	218
1.5	Check exhaust turbocharger and charge pressure control valve - Engine codes AEB, AJL	223
1.6	Check exhaust turbocharger and boost pressure control valve - Engine codes ANB, APU	225
1.7	Effects of leakages on intake side	228
1.8	Effects of leakages on exhaust side	228
1.9	Checking mechanical air recirculation valve	229
1.10	Check air recirculation valve for turbocharger -N249 - Engine codes ANB, APU	230
1.11	Checking solenoid valve for boost pressure control -N75	236
1.12	Boost pressure sender -G31 - Engine codes ANB, APU	242
2	Servicing boost pressure system with exhaust turbocharger	245
2.1	Servicing boost pressure system with exhaust turbocharger	245
2.2	Rules for cleanliness	245
2.3	Removing and installing turbocharger - overview	246
2.4	Removing and installing turbocharger	252

2.5	Removing and installing parts of charge air cooling system . . . . .	.257
2.6	Removing and installing charge air cooler (intercooler) . . . . .	.259
26	- Exhaust system . . . . .	.261
1	Removing and installing parts of exhaust system . . . . .	.261
1.1	Removing and installing parts of exhaust system . . . . .	.261
1.2	Vehicles with front-wheel drive . . . . .	.261
1.3	Vehicles with four-wheel drive . . . . .	.267
1.4	Separating centre and rear silencers . . . . .	.273
1.5	Removing and installing exhaust manifold . . . . .	.275
1.6	Removing and installing catalytic converter . . . . .	.279
1.7	Removing and installing exhaust feed pipe . . . . .	.282
1.8	Stress- free alignment of the exhaust system - Vehicles with front wheel drive . . . . .	.283
1.9	Stress- free alignment of exhaust system - Vehicles with four wheel drive . . . . .	.285
1.10	Checking exhaust system for leaks . . . . .	.287
2	Check secondary air system - Engine code ANB . . . . .	.288
2.1	Check secondary air system - Engine code ANB . . . . .	.288
2.2	Checking secondary air inlet valve -N112 . . . . .	.294
2.3	Check relay for secondary air pump -J299 and engine for secondary air pump -V101 . . . . .	.300
2.4	Check combination valve for secondary air inlet for function and leakages . . . . .	.305
2.5	Removing and installing combination valve for secondary air inlet . . . . .	.307